Stakeholders’ Perceptions of the Decentralisation of the Bachelor of Education in Science through Open Distance and E – Learning (ODeL) of the University of Zimbabwe

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Abstract

Learning in the comfort of one’s home, while working without worrying about manpower development leave and affordable cost is now real. These are some reasons research attribute to the popularity of learning through Open Distance and e – Learning (ODeL). This study investigated the decentralisation of the Bachelor of Education Degree (BED) Science and Mathematics ODeL programme, by the University of Zimbabwe in partnership with Mutare, Hillside and Belvedere Teachers’ Colleges. The purpose was to analyse the process of decentralisation of BED ODeL to participating secondary teachers’ colleges (PSTCs), in order to find out whether the present plans and design for decentralising the programme were perceived as feasible by those involved. The qualitative methodology employed used case studies (interviews, focus group discussions and workshop observations) of BED ODeL students, tutors and coordinators to find out their views on the decentralisation of the programme. Case studies were relevant in order to gain insight into how stakeholders perceived the decentralisation process. Qualitative data analysis methods involving coding cross-data analysis and interpretation were used. The main findings were that stakeholders appreciated the decentralisation of the BED ODeL programme, since it resonated with the national goal of developing science and technology (S&T) skills in learners through science education. S&T skills are considered to be necessary for individual and national socio-economic development world over. However, stakeholders were not sure of programme ownership, their roles and conditions of service in programme implementation. Lack of clarity was attributed to insufficient information dissemination to stakeholders, hence need for improvement. It is recommended that programme coordinators should ensure that the intentions, ownership issues and the implementation of the decentralisation are well understood by all stakeholders, to enhance their full participation focusing on achievement of intended goals.

Keywords: Open Distance Learning, e-learning, decentralisation, stakeholders, ownership, information dissemination

Introduction

Science and Technology (S&T) attributes are considered vital for socio-economic development worldwide (Pakistan Council for Science and Technology (PCST), 2012, p.1). Application of science in nutrition at home, environmental conservation, choosing the right technological gadgets, making political decisions on science and technology related issues are some illustrations of the importance, and far reaching effects of either learning science or not, both at individual and national levels (PCST, 2012, p.13; The Chinese National Commission for UNESCO, 2000. P18). Therefore, science education is an important component of the school curriculum, which every learner should
experience, in pursuit of both S & T and inclusive education global goals (ZIMSEC, 2013, p.4). A country’s capacity to be innovative using S & T depends on the availability of appropriately educated and skilled human resources, as well as infrastructure. Development of S & T skilled human resources has its foundation in science education which should begin at primary school level, and then strengthened at secondary and tertiary levels (MSTD, 2012, p.5). This clearly underscores the need for enough high quality science and mathematics teachers at primary, secondary and tertiary education levels. Such teachers would prepare students to function effectively in an increasingly technological and information based environment (Maringe, 2012, p.42).

The demand for science and mathematics education teachers is increasing worldwide. This is putting pressure on teacher education institutions to increase production of science and mathematics education teachers, yet economic challenges are indicating the need to reduce expenditure (Sampong, 2009, p.1). Learning in the comfort of one’s home, while working without worrying about manpower development leave and affordable cost, are some of the reasons as reflected by many research findings, why Open Distance and e-Learning (ODEL) is becoming a popular worldwide mode of learning in all fields of education (Perraton, Robinson & Creed in Sampong, 2009, p1; African Development Fund, 2011, p.10). At African continental level, Africa Virtual University (AVU) has responded to the need for enough high quality science and mathematics teachers through a blended ODEL programme, which uses mainly e-learning strategies with few face to face contact hours (African Development Fund, 2011, p.10).

Brief Overview of AVU ODEL Science Teacher Education Programme

Africa Virtual University (AVU) responded to challenges associated with provision of quantity and quality Science and Mathematics teachers in Africa by initiating a continent wide consortium in 2008 which comprised twelve universities in 10 counties. The focus of the programme at its inception was on providing enough Science and Mathematics teachers through the use of ICTs. Results of a pilot study conducted between October 2008 and July 2009 in partner institutions (PIs) namely University of Nairobi, Universite’ Cheikh Anta Diop, Amound University and East Africa University revealed that the AVU Teacher Education Programme had capacity to improve the quality and quantity of science and mathematics teachers, in addition to contributing to the elimination of gender divide in performance in Science through the provision of gender bias towards science and mathematics teacher preparation (Pilot Study of the Teacher Education Programme at http://www.avu.org/Teacher-Education-Programme/pilot-stu). The 12 Universities that were involved are:

1. Amound University, Somalia.
2. East Africa University, Somalia.
3. Jamina University, Ethiopia.
4. Universite’ Cheikh Anta Diop, Senegal.
5. University of Hangeisa, Somalia.
7. Universidade Pedagogica, Mozambique.
8. Universite’ Antananarivo, Madagascar.
10. University of Zambia.
11. University of Zimbabwe.
12. African Virtual University

Africa, through African Virtual University (AVU) intervention strategies, has taken advantage of ICTs to address challenges associated with quantity and quality, facing the teaching profession (Boitshwarelo, 2009, p.5). The AVU is a satellite based distance education project that was initiated in 1995 by the World Bank. The broad objectives of the AVU are to deliver to countries of the sub-Saharan Africa (SSA), university education in the discipline of science and engineering, non-credit/continuing education
programmes and remedial instruction. The AVU sought to strengthen capacity of target institutions, through improved ICT connectivity and developing, delivering and managing ICT-aided teacher education.

The overall objectives of the consortium programme are to:

1. Improve the quality of teaching and learning in Physics, Chemistry, Biology and Mathematics through the use of ICTs.
2. Increase the number of Physics, Chemistry, Biology, Mathematics and Computers Science teachers by expanding access to training through the use of Open Distance e-Learning.
3. Develop and promote research in teacher education in order to encourage evidence-based decision making in all aspects of teacher development.
4. Promote regional integration and strengthen relevant partnership with other teacher education initiatives in Africa and globally.
5. Contribute to the Millennium Development goal.

The objectives of the Consortium Programme and the MDGs form a robust theoretical basis for the use of ODeL in science teacher education (Consortium Programs at http://www.avu.org./Consortium-Programs/Consotium-prog). The basis for guidance by the consortium programme objectives was the common quality assurance mechanism for PIs.

**Mode of delivery**

The mode of delivery is blended approach, which entails online and face to face interaction through Open Distance e-Learning centres in partner institutions (PIs). The PIs are the 12 universities named above. The role of each PI is to co-ordinate programme implementation in each country. Multimedia approach adopted, that is e-learning, CD-ROMS and print, help more learners to access and benefit from the programme as the combination overrides the technological gap between institutions and countries. It has to be mentioned that the actual modalities of implementation vary with each PI although the general guiding framework is the same. The activities discussed above were guided by the objectives of Phase 1 of the AVU programme.

Currently in 2016, the AVU programme is in Phase 2. There are 27 PIs from 22 countries (African Development Fund, 2011, p.10). Although the UZ was a PI in Phase 1, it is not a PI in phase 2 which is a disadvantage because networking of UZ in ODeL activities at continental level is restricted.

**Rationale for ODeL methodologies**

African Development Fund, (2011, p.iv) observes that traditional university model currently adopted by most universities in Africa is unable to meet either the current or projected demand for Higher Education, and is also costly. The New Partnership for Africa’s Development (NEPAD) has recognised ICT as a key priority in development efforts for Africa as a continent, because it can address this demand gap by applying ICT methodologies to provide Higher Education through a deliberate choice to use the ODeL approach for programme development and delivery (African Development Fund, 2011, p.iv).

Blended ODeL teacher education in-service programmes are gaining currency in today’s environment where conventional university learning is expensive and in some cases where university places are limited or where the learner cannot get manpower development leave (Perraton, Robinson & Creed in Sampong, 2009, p.1). ODeL methodologies allow two way synchronous (video conferencing, skyping) and asynchronous (e-mail, and dialogue journals) communication which enable the learner to
get feedback, hence improving learning (Boitshwarelo, 2009, p.2).

**Science and Mathematics ODeL Teacher Education Programme in Zimbabwe**

In an effort to produce teachers for science and mathematics education many universities in Zimbabwe are implementing innovative approaches to both pre-service and in-service science and mathematics education teacher preparation. These include full time, part time, block release and visiting school science and mathematics teacher education diploma and degree programmes. The University of Zimbabwe (UZ) began implementing the Science and Mathematics ODeL Teacher Education Programme in September 2010 with three participating secondary teachers’ colleges (PSTCs) namely Hillside Teachers’ College (HTC), Belvedere Technical Teachers’ Colleges (BTTC) and Mutare Teachers’ College (MTC). The programme centrally implemented by the UZ from its inception offered Bachelor of Education Degree (BED) in Physics, Biology, Chemistry and Mathematics respectively. The UZ and PSTCs played their respective roles in implementation of the programme consistent with AVU consortium objectives.

**Context of decentralisation of the BED ODeL programme in Zimbabwe**

The study done before this one focussed on the Institutionalisation of Open Distance Electronic Learning BED in Science Teacher Education at Mutare Teachers’ College (MTC) in Zimbabwe. In this phase of development of BED ODeL, institutionalisation was implemented through a centralised model, with the UZ as the centre of implementation. This tended to present challenges in information dissemination from UZ, and also slow response to challenges at PSTCs which they could easily deal with given the mandate (Matorevhu & Mutseekwa, 2013, p.98). In the decentralisation phase, the UZ transferred roles like advertising, selecting candidates, tutoring of candidates to PSTCs. Also a tracer study focussing on Performance of Open Distance and e-Learning Bachelor of Education Degree (BED) Science Graduates in Zimbabwe (Matorevhu & Mutseekwa, 2015, p.260) showed that the institutionalisation was successful because stakeholders indicated overwhelmingly that the BED ODeL Science and Mathematics graduates performance was resonating with expected curriculum requirements, including the development of STI and STEM compliant learner outcomes (ZIMSEC 2013, p.3).

**Rationale for decentralisation**

According to the Acting Dean’s letter of 2015 to PSTCs and other stakeholders, this approach is designed to upscale the training of Science and Mathematics teachers for secondary education.

**Stakeholders in the decentralised BED ODeL Teacher Education Programme**

The following are stakeholders in the decentralisation of the ODeL Teacher Education programme in Zimbabwe:

- The Department of Science and Mathematics Education (DSME) of the UZ.
- PSTCs lecturers.
- UZ ODeL Students in PSTCs.
- Ministry of Primary and Secondary Education (MoPSE), the then Ministry of Education, Sport, Art and Culture (MoESAC). It provides secondary schools for student teachers to do attachment teaching practice (ATP) and mentors.
Purpose of the study

This study sought to analyse the process of decentralisation of BED ODeL to PSTCs, in order to find out whether the present plans and design for decentralising the programme were perceived as feasible by those involved. The level of knowledge about the decentralisation of the Science Teacher Education ODeL programme, and the consequence feeling of well preparedness were of interest. While practitioners and researchers agree that technological advances of e-learning are dramatically altering the training landscape (Boitshwarelo, 2009, p.1), there is more that needs to be known on how the changes are occurring. Therefore, it was also the purpose of this study to contribute to the development of literature on ODeL in science teacher education.

Research questions

The study sought to answer the following questions:
1. To what extent has the ODeL science and mathematics teacher education programme succeeded in mobilising and equipping relevant stakeholders, for active involvement in the organisational structure of the decentralisation of the programme?
2. What measures and strategies can be put into place, to ensure that the process of decentralisation succeeds?

Methodology

The qualitative methodology involving the case study design was used due to its relevance to the evaluative nature of the study. The case which the study investigated was the Science Teacher Education ODeL programme. The population for the study comprised PSTCs science education lecturers, BED ODeL students, and PSTCs co-ordinators. Using purposive sampling, two lecturers and one co-ordinator from each PSTC were selected. Convenience sampling was used to select ten prospective BED ODeL students from the College the researcher was based to reduce challenges associated with availability of time and travelling costs.

Data sources in the study were lecturers, administration staff, ODeL laboratories and infrastructure. Data was collected through document analysis, observation of workshops by the researcher as a participant observer, interviews and focus group discussions during workshops. Some of the data collection strategies were emergent. For instance, the use of workshops was adapted after analysing the decentralisation schedule sent to PSTCs by the UZ. This flexible adaptive approach was found suitable, since the main aim of the study was to gain insight through exploration of the process of programme decentralisation, and find the best way to achieve programme objectives. Several methods were used in data collection to ensure trustworthiness of data and validity of findings through triangulation.

The design of interview schedule, observation schedule and document analysis guide was based on research questions. The interview schedule had questions grouped into categories of:
1. Knowledge about the decentralisation.
2. Communication.
3. Interviews.
4. Resources for the programme.
5. Individual role.
6. Conditions of service.
7. Progress of the programme.

Qualitative data from interviews, observations, document analysis and focus group discussions were put into categories (coded). Through cross-data analysis data was analysed and interpreted.
Findings

The findings are presented in the following categories:
1. Knowledge about decentralisation.
2. Communication.
3. Resources for the programme.
4. Individual roles.
5. Conditions of service.
6. Achievements of the decentralisation process.
7. Strengths of the decentralisation process.
8. Weakness of the decentralisation process.

Knowledge about decentralisation

Stakeholders (PSTCs lecturers, administrators and prospective BED ODeL students) revealed excitement about the direct involvement of their institutions in BED ODeL programme. They said they were aware that the programme sought to improve the quantity and quality of science and mathematics teachers, and they were ready to contribute.

One PSTC lecturer said:
We were informed at college through both staff and departmental meetings, and encouraged to be supportive. When you are well informed about something you are bound to feel a sense of belonging and become part of it. However, lack of information may cause stakeholders to wittingly or unwittingly not support the implementation process.

This quotation shows how some things which may appear of little important have the potential to frustrate implementation of a programme. In this case, poor dissemination of information to those who feel should have it may develop resistance to programme implementation.

Communication

During workshops, ways of communication among lecturers, tutors, coordinators and student teachers were discussed. It was stressed that communication on challenges faced or any issue which might promote the smooth implementation of the programme was vital for success of the decentralisation of the BED ODeL programme. Email addresses, Short Message Services (smses), whatsapp and telephone were accepted as means that will be used for communication by various stakeholders.

Workshops with prospective students

Orientation workshops were held in January 2016 at MTC, HTC and BTTC, respectively. Workshop presentations involved:
- Testimonials to prospective BED ODeL candidates by ODeL graduates on advantages of ODeL, and how to study for success in the course;
- Course requirements and registration procedures were presented and discussed with prospective ODeL graduates; and
- More importantly participants were advised to make informed decisions about joining now, or prepare and join later.

One graduate of the programme gave a testimony saying:
The programme is very appropriate especially when the employer is no longer willing to give paid manpower development leave. Again you set the learning conditions which you find favourable to you. The reading materials are simple, but informative with a lot of internet sources you can access even over the cell phone.
Informing the prospective students about deciding on whether to start the programme or not, one lecturer said:

*As prospective candidates you are now equipped with knowledge about what the programme entails. Now, it's upon yourself to make the decision to start now or later when you are ready. However, remember that sometimes you also need to be bold and sacrifice in order to succeed. The earlier you start the better.*

While the BED ODeL graduate’s testimonial encouraged the prospective students to join the programme because of its perceived advantages, the lecturer’s remark also stressed the need to base choice on practicality in terms of choosing the opportune time in terms of sustenance in doing the programme up to completion. Therefore, the workshop focused on addressing interests and possibilities for all stakeholders (lecturers and prospective students).

**Interviews**

Like the institutionalisation phase, all those interviewed were aware of the ODeL Science and Mathematics teacher education programme. However, interviewees expressed the need for the UZ DSME to engage in advocacy activities in order to market the programme in secondary schools in Zimbabwe. Prospective student teachers interviewed corroborated tutors’ views that ODeL teacher education co-ordinators should timeously communicate all aspects of the programme to both students and tutors through regular meetings. They noted that communication clarifies issues, removes speculation and suspicion, hence developing a shared vision which in turn would develop commitment to the programme. The requirement for an effective communication system is articulated by Zikhali, Mukeredzi, Weda & Nyamanyaro (2011, p.87) saying communication channels and communication aids are important in the design of good and effective client service structure. In this study, lack of communication was interpreted by both tutors and student teachers interviewed as non-involvement of the wider part of Science and Mathematics education department of PSTCs, and a possible threat to the success of the process of decentralisation.

One interviewee said:

*If you lack information about a programme you may not participate because you do not know about it. For instance, I decided to join the programme when a lecturer at Mutare Teachers’ College gave me the advertisement for the current intake of the programme. The discussion I had with the lecturer enlightened me, as well as inspiring me to join hence I am here today.*

The quotation shows that advocacy for the programme is very crucial to help science teachers to join the programme. Therefore, various strategies should be used to disseminate information about the BED ODeL to prospective students.

An important noteworthy concern by tutors was the need to consistently document important communications, since verbal discussions tend to get distorted with time and lose focus. Formal communication and dissemination of information through hard or soft copies of workshop content was identified as one of the effective measures against threats to the decentralisation of the programme, because information distortion would be reduced. This is consistent with the current trends of knowledge driven societies.

**Resources for the programme**

During workshops at PSCTs in January 2016, resources for student teachers were discussed. These were:
Financial comprising expenditure on:

Tuition
• Travelling (To College, UZ and seeing peers/ classmates).
• Internet (Access bundles).

Material comprising:
1. Laptop with CD – Rom.
2. Flash Discs [At least two 4 gig and one 8 gig].
3. Library – UZ [register with E-Mhare and Library.]
4. When registered the UZ library can be accessed anywhere in Zimbabwe.
5. Learning tools e.g bond paper, photocopying, CDs, pens, among others.

The prospective students said the discussion on learning resources was important. During the vote of thanks, one prospective student said:

The workshop information would assist students to prepare for the programme through sharing information, and subsequently acquiring the financial and material resources for the programme.

The quotation reveals that if preparation is done from an informed perspective, implementation will be done in line with the programme objectives. The implication in general is that sharing information encourages willingness to do the programme due to shared vision, hence, programme success.

Individual roles

Workshops were held in January 2016 at MTC, HTC and BTTC respectively with UZ lecturers, the respective college lecturers (tutors) and prospective ODeL students. Another workshop was held with UZ lecturers, UZ Dean of Education, Chairperson of the Department of Science and Mathematics Education (DSME) and tutors at the UZ on February 2016. These workshops helped to clarify grey areas of the decentralisation.

The UZ Roles were described as provision of the structures, resources and expertise that would enable the programme to increase access to higher education and training in Science and Mathematics Education, through provision of:
• Lecturers for the programme.
• Learning materials electronically and hard copies of modules.
• Setting and marking tests and examinations.
• Co-ordination framework of overall programme implementation.
• External supervision of student teachers on attachment teaching practice (ATP).
• Online Library services.

Roles for MTC, HTC and BTTC were described as provision of:
• Tutors who will interact with learners face to face.
• Tutorial and practical sessions conducted during weekends and school holidays.
• Internal supervision of students on ATP.
• Laboratory equipment.
• Rooms for tutorials.
• Computer and internet services.
• Practical work and marking it.
• Invigilation of tests and examinations.

Prospective tutors reflected excitement on their intended increased involvement in conducting practicals of BED ODeL students. One prospective tutor said:

In this degree programme the practical component has been weak, because students had almost not been doing practicals science UZ lecturers could not do it alone for the three colleges. This has not been consistent with the goals of STEM which is topical these days. Our involvement in assisting students do
practical work makes me proud that the science teachers in the programme are being equipped with relevant skills to teach consistent with STEM objectives.

Analysis of this excerpt shows PSTCs lecturers aim to contribute positively to achieve Zimbabwe’s national goals by producing relevant science teachers. On the part of the UZ, this reflects improvement through research backed implementation because a preceding study (Matorevhu & Mutseekwa, 2015, p.261) showed that the practical component of the BED ODeL programme was weak, which was incongruent with programme objectives.

**Conditions of service**

It should be noted that in the study on the institutionalisation, concern was raised by tutors on little remuneration they were getting. During workshops the issue of remuneration was raised again, but it was shelved for later discussion. There is need to seriously look into this issue if the success of the decentralisation process is to be assured.

**Achievements of the Decentralisation Process**

The following are achievements noted in the decentralisation process:
- Development in tutors’ confidence, motivation and commitment to programme implementation; and
- Improvement in the sense of ownership compared with findings of the previous study (Matorevhu & Mutseekwa, 2013, p.100).

**Strengths of the decentralisation process**

The following are strengths of the decentralisation process that were identified by the study:

1. BED ODeL student teachers get more face to face individual assistance, hence better skills to respond to individual learner needs in schools are developed.
2. Sharing of tuition fees with Colleges unlike during the institutionalisation phase. Colleges can now use tuition fees to offset costs.
3. BED ODeL student teachers now have more exposure to practical work / experiments unlike in the institutionalisation phase.
4. Implementation of research findings, for instance, recommendation on practical work and improved communication made in the report on the institutionalisation phase.

The UZ has gained experience and learnt lessons in ODeL methodologies from the institutionalisation phase of the BED ODeL programme. The decentralisation should aim at consolidating these gains made during institutionalisation, and scaling up the programme’s outputs and outcomes regarding access to Higher Education. Therefore, it is believed that the decentralisation process will occur in a relatively smoother manner.

**Weakness of the decentralisation process**

The following are weaknesses that were noted in the decentralisation of the programme:
- Lack of networking by the UZ with consortium partner institution of AVU which reduces knowledge base about programme implementation.
- Lack of continuous financial support for the programme in form of grants.
- The absence of Computer Science BED ODeL implementation by the Colleges involved. This is not consistent with world trends of integrating ICTs in education.
Conclusion

The process of decentralisation is consistent with programme objectives, but issues raised by this study need attention to improve implementation. Funding is a challenge to colleges, and ways to fund raise should be sought. Recommendations are given below.

Recommendations

1. The UZ should work with the AVU Consortium because evidence available shows that the UZ is not among the current 27 AVU partner institutions in the Consortium:
2. The UZ needs to have strategic plan on paper which must be made available to all PSTCs. The strategic plan should be premised on lessons learnt from the process of Institutionalisation as well as the current needs in the context of both local and global factors.
3. PTSCs should be assisted by the UZ as an experienced institution, to establish partnerships and networks with:
4. The business community in order to get financial support; and
5. Other institutions involved in ODeL to share information.

References


